

WORKING PAPER ON RESTORATION NEEDS

HABITAT RESTORATION ACTIONS
TO DOUBLE NATURAL PRODUCTION OF ANADROMOUS FISH
IN THE CENTRAL VALLEY OF CALIFORNIA

Volume 3

Prepared for the U.S. Fish and Wildlife Service
under the direction of the
Anadromous Fish Restoration Program Core Group

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Action 3: Maintain positive QWEST flows, or an equivalent measure of net seaward flows at Jersey Point, of 1,000 cfs in critical and dry years, 2,000 cfs in below- and above-normal years, and 3,000 cfs in wet years from October 1 through June 30.

Objective: Increase survival of smolts migrating down the mainstem rivers, decrease the number of smolts diverted into the central Delta, increase the survival of smolts diverted into the central Delta, and provide attraction flows for San Joaquin Basin adults (October-December).

Location: Flows are presently calculated for QWEST. Measured flows would be preferable.

Narrative description: Upon reaching the mouth of the Mokelumne River on the lower San Joaquin River, juvenile salmon diverted into the central Delta are often exposed to upstream flow (reverse flows) that moves the net flow easterly in the San Joaquin River and toward the south via Old and Middle rivers. These reversals of flow are exacerbated during periods of high pumping. Susceptibility to diversion into Clifton Court Forebay or entrainment at the CVP and SWP pumping plants is also more likely for fish migrating through the central and southern Delta than for those migrating down the mainstem Sacramento River, presumably because of these reverse flows. Reverse flows also make it less likely that smolts originating in the San Joaquin Basin will successfully reach the ocean.

Fall-run CWT fish released in the lower San Joaquin River at Jersey Point between 1989 and 1991 showed that after corrections for temperature at release, reverse flows in the San Joaquin River at Jersey Point appeared to decrease the survival of smolts migrating through the lower San Joaquin River ($r=0.76$, $p<0.10$) (USFWS 1992b).

Also, reverse flows in the western San Joaquin River and diversion into the central Delta through Threemile Slough may be the reason for survival being less for fall-run CWT fish released at Ryde between 1984 and 1992, when flow at Jersey Point (QWEST) was negative. The relationship between smolt survival and flow at Jersey Point (QWEST) is apparent when QWEST flows are between -3,000 to +2,000 cfs ($r = 0.75$, $p<0.01$) (P.Brandes, USFWS, pers. comm.).

Related actions that may impede or augment the action: Export limits and DCC gate closure would result in a survival increase greater than the increase resulting from the improvement of reverse flows alone.

Agency and organization roles and responsibilities: USBR and DWR would be largely responsible for a change in QWEST because it is related to exports and Delta inflow. Water users on the San Joaquin and Sacramento rivers may also be partially responsible for contributing to Delta inflow.

Potential obstacles to implementation: This action may inhibit exports and may require additional flow from the San Joaquin River.